

ing the variety placed by Couch in plate lxxx. below the "Spanish Mackerel" (*S. scriptus*), but which he observes that he "supposes it to be a different species," it seems to be another variety in colour of the common form, in which the first dorsal fin is a little more forward and the second spine is slightly higher, if such is not an error in the figure. He also observes that this variety "has no air-bladder;" and likewise expressed his belief (p. 82) that none is present in *S. colias*, although such has been described in Cuvier and Valenciennes's 'Histoire Naturelle des Poissons,' 1831, viii. p. 47; but not believing in its existence, Couch appears to have fallen into an error.

On two Cases of Incorporation by Sponges of Spicules foreign to them. By STUART O. RIDLEY, F.L.S., Assistant in the Zoological Department, British Museum.

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Two cases of this phenomenon, to the common occurrence of which Mr. Carter has already called attention*, have recently come to my notice while working out some Sponges from the southern hemisphere, and they seem to me to be of some interest. The one is that of a specimen assigned to the genus *Ciocalypta*, Bowerbank, in which the dermis would be almost naked (a very unusual character) but for the occurrence in it of certain long acuate spicules having a very slight elongated basal inflation or head. They are found scattered through the membrane, singly or in loose bundles. The superior ends of the main skeleton-fibres themselves reach the dermal surface, and there spread out like the branches of the date-palm; but they do not extend across the surface to the same amount as in *Ciocalypta penicillus* and *C. Leei*, Bowerbank; for here they do not meet their fellows to form the lattice-like surface meshwork which is so conspicuous a feature of those species. It is therefore in the vacant spaces left between the freely-terminating ends of the skeleton-fibres that the subcapitate acuate spicules above mentioned are found. They measure from .426 to .468 millim. in average greatest length by .011 to .01267 in thickness; they taper gradually to a fine point, and the head, which is only plainly discernible under a high power

* Ann. N. H. (4) xvi. pp. 11, 16, xviii. pp. 230, 232. Cf. also *Id. op. cit.* (5) ii. p. 358.

of the microscope, is of a very elongated oval shape, sometimes of irregular outline; the spicule diminishes in diameter just below the head, which is of about the same diameter as the thickest part of the shaft, although, from its superiority in size to the "neck," this is not at first evident. Had the spicule not been of so interesting a type, it might perhaps have been set down as the proper dermal spicule, as "occurring irregularly scattered or fasciculated," especially as a special dermal spicule is wanting, and the dermis presents otherwise an unusually bare appearance. Also the characters of the skeleton-spicule of the sponge would rather lead one to believe the dermal form to be merely one slightly altered, owing to position, from its type, as its relative shortness (a character commonly distinguishing dermal and skeleton spicules), identical thickness, and similar shape would lead one to conclude. The skeleton-spicule is acute, slightly bent, sharply pointed, with a well-rounded basal end, without inflation, size $\cdot577$ by $\cdot01267$ millim.

However, a reference to sketches of the spiculation of another sponge, an *Esperia*, from exactly the same locality, and obtained, as its association in the same vessel with the *Ciocalypta* would seem to show, at the same haul of the dredge, demonstrated an identity in form between this spicule and the one which forms the main skeleton and the dermal network of that sponge. As the drawings were not both made to scale, measurement was necessary to satisfy the doubt as to the possible common origin of the two spicules, with the result that the main skeleton-spicule of this second was found to measure $\cdot544$ by $\cdot01267$ millim.; while the average largest size of the dermal spicules, which agree precisely with the skeleton-forms as to shape and proportion, is $\cdot468$ by $\cdot01267$, just the size, as will be seen by comparison with the measurements given above for the spicule from the dermis of the *Ciocalypta*, of the largest of those there discovered. The inference is unavoidable, that the latter sponge has adorned and strengthened its dermis with elements derived from the dermis of the *Esperia*, which probably grew close by, and which, from the friable character of its surface, even in the spirit-specimen which we possess, probably frequently lost its surface-spicules either by attrition against tide-borne objects or by their natural shedding in the course of growth. The former hypothesis is not an impossible solution, for the depth at which the sponges grew was only 7-10 fathoms. Of their being lost by natural shedding, I know

no analogous facts in confirmation, the evidence rather tending to show that as growth continues the surface-spicules, if of the same kind as those of the main skeleton, become incorporated with it either by adhesion to the perpendicular (primary) lines or by remaining horizontal to form the latest-formed "secondary lines"; at any rate, the appearances seen in perpendicular sections of some of the regular *Isodictya* seem to point to this conclusion.

The other instance is that of *Alebion* (Gray) sp., and needs no special detailed account, as the circumstance of occurrence of the foreign spicules is essentially the same. It is also the same spicule (measuring here slightly less, .45 by .01056 to .01108 millim.) which is the intruder. It occurs scattered or in bundles in the dermis. The sponge is also from the same locality and depth as the *Esperia* above mentioned; but, unfortunately, the number of the jar in which it arrived is not preserved, so that it cannot be presumed with such probability that it is from the same haul of the dredge.

It only remains to draw the attention of workers at sponges to these two cases, by way of warning against being misled by spicules occurring chiefly in the dermis of sponges, which are not so universally distributed there as to lead to the conclusion that they belong to the sponge, even though, as in this case, the fine preservation of the spicule and absence of enlargement of the central canal would not suggest their being foreign to it. Sometimes this may be seen at a glance, as when an obviously calcareous triradiate spicule is found in a sponge whose complement is made up (*e. g.*) of siliceous acerates, or when an unmistakable *Geodia*-ball occurs under similar circumstances. But the present is one which differs essentially from such cases; the spicules are well preserved, present some degree of regular arrangement, and are not radically distinct from the type which would be expected in the sponge. Still the difference of form and the manner of occurrence are sufficient to point out their foreign origin in this case; and if, as is far the most usual, they had been broken, or their central canals were enlarged by absorption, or the heads had projected outwards and the points inwards, these, which are the safest proofs of the foreign origin of a spicule, would have infallibly guided to a correct judgment as to their nature.
